Research in Simulation: Research and Grant Writing 101

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Overview

- Types of simulation research
- Selecting research topics and drafting hypotheses
- Types of research grant proposals
- Purpose of grants
- Finding funding opportunities
- Preparing research grant applications
- Gathering data and making the case
- Proposal developing and budgeting
Objectives

- List the types of research proposals.
- List the components necessary to effectively develop a research project.
- Describe how to complete a research project.
- Discuss where to find key grant funding opportunities.
- Outline a systematic approach to completing a grant application.
- Identify 5 tricks that will help facilitate completing a grant application.
Time for a brief audience poll. Please have your clickers ready.
How many research proposals have you designed and carried out?

Please press:

1. None
2. Between 1 and 3 projects
3. Completed 4 or more projects
4. What is research?
Please rate your level of knowledge about grant proposal preparation

Please press:
1. No knowledge or very limited knowledge
2. Some knowledge
3. Significant knowledge
4. I should be teaching this course
RESEARCH
Types of Simulation Research

Education
e.g., Impact of an online training module for out-of-hospital pediatric respiratory distress (De Maio, et al.)

Process Improvement
e.g., Air medical providers’ response to a simulated scene trauma (Hinchey, et al.)

Injury Prevention/Medical Errors
e.g., Next-Day effects of excessive alcohol on laparoscopic surgery (Gallagher, et al.)

Clinical Interventions
e.g., King/IO vs. ETT/IV for prehospital resuscitation (Lanier, et al.)
Education Research

• “individuals evaluate different aspects of education including, but not limited to:”
  – Student learning
  – Teaching methods
  – Teacher training
  – Class dynamics

• Conducted in a rigorous and systematic way.

http://en.wikipedia.org/wiki/Educational_research
Process Improvement

- Review and analysis of a series of actions to improve existing processes within a system or organization.

- Method to introduce process changes to improve the quality of a product or service, to better match customer and consumer needs.
Core Principles of PI

1. Make the work problem-specific and user-centered.
2. Variation in performance is the core problem to address.
3. See the system that produces the current outcomes.
4. We cannot improve at scale what we cannot measure.
5. Anchor practice improvement in disciplinary inquiry.
6. Accelerate improvements through networked communities.

http://www.carnegiefoundation.org/improvement-research/approach
Injury Prevention & Medical Errors

• Injury prevention
  – Injuries that are “preventable by a changing environment, individual behavior, products, social norms, legislation, and governmental and institutional policies to reduce or eliminate and increase protection factors.”

• Medical Errors
  – “preventable adverse effect of care, whether or not it is evident or harmful to the patient.”

http://www.vahealth.org/Injury/aboutinjury.htm
http://en.wikipedia.org/wiki/Medical_error
Haddon Matrix

http://www.vahealth.org/Injury/aboutinjury.htm
Clinical Interventions

• “An intervention carried out to improve, maintain or assess the health of a person, in a clinical situation.”

• Invasive or non-invasive procedures

• Cognitive interventions (evaluating, advising, planning, etc.)

http://meteor.aihw.gov.au/content/index.phtml/itemId/327220
Uses of Simulation Research

- Assess skill acquisition and retention following educational interventions
- Measure performance of procedures
- Evaluate processes of care/protocols
- Study high risk or uncommon events
- “Translational” research
Limitations of Simulation Research

• NOT patient outcomes research
• No established methodologies
• Lack of standard/valid/generalizable outcomes measurements
• Equipment expense
• Human resource intensive (development, validation, implementation, debriefing)
• Scheduling
A Good Research Question

The PICO Method:
Population/Problem – relevant, generalizable
Intervention – clinically important
Comparison – main alternative/control
Outcomes – specific, measureable, valid

e.g., In prehospital cardiopulmonary resuscitation, does the use of the King airway plus IO device compared with ETT plus peripheral IV improve time to airway control and IV access and CPR performance metrics
A Good Research Project...

Meets a business need too!

Knowledge → Experience → Wisdom → Wise Decisions → Business Success

- Managed Experiences
- Shared Experiences
- Simulated Experiences

What is the value to the SIM Center?
What is the reward to:
• the PI?
• the collaborators?
• the stakeholders?
• the participants?
The SIMULATION Proposal
Basic Anatomy of the Proposal

- Background/Relevance – describe the problem, literature, importance
- Objectives – clear, concise
- Methods – hypothesis, population, setting, equipment, intervention, primary outcome, analysis
- Deliverables/Knowledge Translation
Is it Doable?

1. YOUR Area of Interest/Expertise
2. Narrow scope, Specific question
3. Measurable Outcomes
4. Stakeholder Buy-In
5. Resources Available
6. Preliminary Data (pilot/feasibility)
OBJECTIVE:
To use simulation to eliminate all medication errors in ABC Children’s Hospital

- Is it specific?
- Is it realistic?
- Can you test it?
- Is there a good outcome measure?
OBJECTIVE:
To use simulation to evaluate whether medication administration check-lists reduce errors of incorrect medication dosing by nurses at ABC Children’s Hospital.

- Is it specific?
- Is it realistic?
- Can you test it?
- Is there a good outcome measure?
Selling Your Proposal

- Experience of PI and collaborators (i.e., CV)
- Research environment and culture
- Appropriate facilities
- Involve stakeholders and partners
- Competent research team
- Adequate statistical support
- Preliminary Data
Writing Grant Proposals
What will grants fund?

- Piloting of new programs
- Expansion of existing programs
- Research projects
- Equipment *

Not likely to be funded:

- Support for existing programs
- Conference travel
- Equipment *
- Bricks and mortar/ construction
Finding Funding Opportunities
Where to look?

• The Foundation Center Online
  ➢ fee-based foundation grant database
• Grants.gov
  ➢ contains all federal grant opportunities
• ScanGrants.com
  ➢ contains healthcare grant opportunities
• Searching using Google or other search engines
• Your state’s Department of Health and Human Services
How do I know if a funding opportunity is right for my project?
What’s your problem?

Identify the problem or need that you are trying to address.
Gathering Data to Support a Project

Compile data that includes:

- Facts and figures to illustrate the problem:
  “15,000 Medicare patients die each month, in part, from the care they receive in the hospital. 44% of these deaths are due to medical errors”*

- Estimates of the impact the grant will have:
  “We anticipate that 30% of participants will improve more than one process”

*from Institute of Medicine
Use your compiled information to create a brief project abstract.

Review your abstract and compare it to the interests stated in the funding announcement.

Be realistic. Submitting a project that is not a good fit is a waste of your time.
Using data in your proposal

The type of data required for your proposal depends on project type and funder.

Examples:

In-depth statistical analyses and power calculations may be required for a federal research proposal.

A foundation providing seed money for pilot projects may prefer limited, impactful data and less jargon.
The Research Team: "Putting the right team together is key"

- Federal grants require involvement of experienced investigators
- Methods leadership and content expertise
- Statistical consultation at development stage
- Stakeholders represented
- Institutional approvers
- Human subject participants
Making Plans

Read all sections of the Request for Proposals carefully

Create an outline that includes all required components

Recruit appropriate collaborators and team members

Draft a timeline for completion of all requirements

Contact the funder for help with determining project fit, if allowed
Young Investigator Research Grant Awards

Purpose:

The AOSpine North America Research Committee (AOSNARC) established research funding that is available to new investigators (Assistant Professor Level or equivalent who are within 5 years of their first appointment) who have a desire to perform high-quality, clinically relevant spinal or spinal cord research in basic or clinical science. The purpose of these grants is to encourage new investigators by providing start-up funding of up to $30,000.00 for one year. Consideration is given to two year applications, through the 2nd year of the grant will require a separate application and peer review.

Call for Application and Application Process:

A Call for Application will be advertised in the major academic spine journal publications in the fall of each year.

In addition, an email will be sent to all members of AOspine North America (AOSNA) and a notice will be posted on the AOspine website at www.aospine.org describing the Call for Application.

The Application Form and Guidelines for a Young Investigator Research Grant will be posted on the AOspine website for download and completion.

The deadline for submission is December 15, 2011. Awards will be announced in March at the AOSNA Fellowship Forum.

All applications are submitted to:

AOspine North America Research Committee
1700 Russell Road
Paoli, PA 19301

Eligibility Requirements:

- The applicant and/or co-applicant must be a subscribing member of AOSNA, but cannot be a "disqualified person" with respect to AOSNA, as that term is defined in Internal Revenue Code Section 4946(a).
- The applicant must be a physician, surgeon or scientist with focused interest in disorders of the spine/spinal cord and with an appointment at a university or hospital-based research institute ("institute").
- The grant application requires evidence that the investigator has the experience and resources to complete the proposed research.
- Neither (i) members of AOSNARC (AOSNARC Members), (ii) members of the family of an AOSNARC Member (as defined in Internal Revenue Code Section 4946(d), nor (iii) any persons over whom AOSNARC Members have substantial influence and/or control (i.e., via employer-employee relationship), are eligible to apply as an applicant.

- Successful applicants must agree to present their research findings at the Annual AOSpine North America Fellows Forum.

- AOSNA must be cited as the source of funding in any publication, presentation or in any publicity resulting from the award or its results.

- The number and amount of research grants awarded each year are at the discretion of AOSNARC.

General Guidelines:

- Application deadlines will be on or around December 15, 2011.
- Submission of the Applications should consist of 1 (one) original. In addition, the Application and all supporting documents are also to be submitted in electronic format on a CD/DVD.
- All correspondence will be sent to the Primary Investigator. It is the responsibility of the Primary investigator to provide information to co-investigators.
- Funds are for work to be performed, not works in progress or already completed.
- Indirect costs shall not exceed 5% of the overall budget.
- A Progress Report, regarding the research project, must be submitted to AOSNARC 6 (six) months after the work commences, using the Research Grant Report Form provided on the AOSpine website. A Final Report must be submitted at the end of the 12 month period and shall include a description of the grant’s accomplishments and an accounting for the funds received under the grant.
- If the work cannot be completed within the 12 month time frame, AOSNA must be notified and a written request to extend the grant must be submitted to AOSNARC for approval to extend the grant. If approved, interim reports will be requested at various intervals (but at least once each calendar year) at the discretion of AOSNARC throughout the remainder of the project.
- When the reports above (or other information (including the failure to submit reports)) indicate any part of a grant is not being used for its intended purpose, AOSNARC has a duty to investigate. During such investigation, AOSNARC shall withhold further funding. Upon completion of the investigation, further funding may be continued if the investigation concludes that no part of the grant is being used for improper purposes. If, however, the investigation concludes that any part of the grant is being used for improper purposes, AOSNARC must comply with the procedures outlined in Federal Treas. Reg. Section 53.4945-4(c)(4).
- AOSNARC reserves the right to discontinue the grant, with return of full funding by the grantee, if for any reason it is determined that the activities for which the grant is intended to address cannot be met.
- Each award will be in the amount of $30,000.00. The number of awards provided per calendar year will be determined based on the allocation of funds determined by the AOSNA Board of Directors.
Meeting Deadlines

- Create templates
- Give yourself enough time
- Provide collaborators with realistic deadlines
- Use collaboration software to streamline writing and editing
- Follow up
Writing Tips

• Avoid unnecessary jargon
• Spell out acronyms the first time they are used
• Pay attention to key words or phrases used in the Request for Proposals
• Describe the relationship between your project and the funder’s core mission and funding interests
10 Tips Four How to Right Good

(Author Unknown)

1. Verbs must agree with their subjects.
2. Prepositions are not words to end sentences with.
3. And don’t start a sentence with a conjunction.
4. Avoid clichés like the plague.
5. Be more or less specific.
6. Also too, never, ever use repetitive redundancies.
7. Contractions aren’t necessary and shouldn’t be used unless you don’t want to seem too formal.
8. Do not use more words, phrases, or other linguistic elements than you, yourself, actually really, definitely need to use or employ when expressing yourself or otherwise giving voice to what you may or may not be thinking when you are trying to say how many words you should use or not use.
9. One should NEVER generalize.
So what? Who cares?

- Why is your project important? What is its impact?
- Why should a funder choose your project to fund over others?
- What makes you the right group or person to do it?
Proposal
Budgeting
Time for a brief audience poll. Please have your clickers ready.
True or False:
Keeping my proposal budget as small as possible, even if it makes it more difficult to complete the project, will increase my chances of getting funded.

Please press:
1  TRUE
2  FALSE
Reviewers are not bargain-hunting

Your budget should contain appropriate staff time and equipment to allow you to meet project goals
Proposal Budgeting

- Budgets should include only costs that are necessary to carry out the proposed work
- Determine fair and accurate costs when drafting budgets
- Obtain written estimates when possible

**Grants are not designed to fill gaps in department budgets**
Direct Costs

**Defined by the NIH Glossary as:**

Costs that can be identified specifically with a particular sponsored project, an instructional activity, or any other institutional activity, or that can be directly assigned to such activities relatively easily with a high degree of accuracy.”
“Indirect Costs”

- Indirects
- Overhead
- F & A
- Facilities and Administrative Costs
Indirect Costs

- Requested in grant budgets to cover the costs of maintaining grant awards
- Include items such as: accounting staff support, phones, electricity, internet access
- Some funders will not pay indirect charges, or will limit the amount
How does my institution handle indirects?

- Many universities and hospitals have established indirect rates that are typically a set percentage of total direct costs.
- In many cases, they are not optional.
- Contact your grants department to determine your institution’s indirect policy.
Caution: Read carefully

The grant budget limit may list DIRECT COSTS, which do not include indirects, or TOTAL COSTS, which include indirects
Justifying Your Budget

• Create a document that explains the need for each line item
• For personnel, include a brief description of the functions of each job role
• Include details of all estimated costs
• Create a template for future proposals
Olive Simulation, BS, RN, Research Coordinator will devote 12 calendar months effort to this project.

Olive Simulation, BS, RN, Research Coordinator (12.0 Calendar Months, Years 1 and 2), has worked in healthcare for ten years, in both critical care and clinical research. She will assist with the administrative management of the project. Ms. Simulation will supervise research staff, liaise between investigators and staff, help to develop and oversee project deadlines, coordinate meetings, and prepare written reports for investigators, collaborators, and key stakeholders. She will also manage the preparation and maintenance of project IRB applications and assist with the preparation of scientific proposals, abstracts, and manuscripts.
Bibliography and References Cited

Which style should I use?

- If not otherwise specified in the Request for Proposals, you can choose an appropriate style.
- Use the same style consistently.
- Choose a style that includes the names of all authors in your References list.
How much/when to cite?

• In project proposals, cite as needed to provide sources of background data and information regarding similar projects
• Using superscript numbers saves space and makes the proposal easier to read
Common Mistakes

- Failure to **proofread**
- Missing information/ Failure to meet all requirements
- Errors in budget calculation
- Budget and budget justification do not match
- Lack of appropriate approvals or signatures
- Preproposal differs significantly from full proposal
- Applying for opportunities for which you are not eligible
Following Directions

- Failure to read and follow directions can result in your application not being reviewed
- Electronic submission sites such as Grants.gov will automatically reject applications that are not compliant with proposal instructions
5 Tricks that will help facilitate completing a grant application

1. Target your proposal to the funding opportunity
2. Give yourself enough time
3. Create templates when possible
4. Focus on the basics when completing your budget
5. When writing, assume that the reviewers know nothing about you or your organization
You have been tasked with helping to plan a grand opening celebration for your new Simulation Center. You secured a piano rental and are seeking a pianist to provide entertainment at the event.

A colleague tells you that he has found the perfect entertainment for the event. He was approached by a friend who recommended a piano duo.

Based solely on the great review that this colleague heard from a friend, you make arrangements to secure this piano duo for the event.
Congratulations – Here is your event entertainment!
Reviewers don’t like this kind of surprise either.
Describing your organization

- “Sell” your institution and its relevant programs and resources in your application.
- Assume the reviewers have no knowledge of your organization
Describing your organization

- Provide sufficient relevant details regarding experience of investigators and support staff

- Describe resources that will be used to aid in project completion.
Convince reviewers that you have ample resources to complete the project.

Demonstrate that you are capable of doing the work that you propose.

Inspire confidence in your team’s abilities.
Funders do not want to waste resources on unsuccessful projects
Time for a brief audience poll. Please have your clickers ready.
What is the role of the IRB in simulation-based research?
Do IRB rules and procedures apply to simulation-based research?

Please press:

1 No
2 Yes
3 Unsure
4 What’s an IRB?
There are still risks to participants such as:

- Embarrassment due to mistakes
- Accidental disclosure of personal information

Participants in simulation research exercises need to be protected, just as if they were patients participating in a study.
Tools and Resources that will help guide you through the grant process

- Determine if your organization has a grants professional on staff
- Organizations such as The Foundation Center and state-level nonprofit resource groups may provide training
- See provided handout for a list of recommended grant writing resources
What do I do when I receive word that my project will be funded?

CELEBRATE!
Notify your institution
Notify all collaborators
Get to work!
Meeting Goals

• When your project begins, stick to the timeline you created
• Document any unforeseen challenges that impede progress
• Work to meet all major goals originally proposed
• DO NOT make significant changes to a funded project without prior approval from the funding agency
Reporting Progress

• Most funders require annual progress reports, in some cases more frequently
• Provide comprehensive information on the period’s project activities
• Describe any barriers to meeting goals
• Describe your plans for addressing them
• Document any changes in personnel
Submitting for Publication

• Analyze data in a reasonable amount of time after completing the project and submit findings for publication where appropriate.
• Submit a final report listing all published articles, posters, and abstracts to the funding agency.
QUESTIONS?